AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-21 (Canceled).

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22. (Currently amended) A computer An computer system for solving an 1 interval global optimization problem specified by a function f and a set of equality 2 constraints, the computer system comprising: 3 4 a processing unit; 5 a memory; an interval arithmetic unit within the processing unit, wherein the interval 6 arithmetic unit is configured to receive floating-point numbers representing a first 7 endpoint and a second endpoint for a first interval and floating-point numbers 8 representing a first endpoint and a second endpoint for a second interval, and is 9 configured to-simultaneously perform arithmetic operations to produce a first 10 endpoint and a second endpoint representing a resulting interval; 11 wherein computational code within the memory is configured to perform 12 an interval global optimization process to compute guaranteed bounds on a 13 globally minimum value of the function f(x) subject to the set of equality 14 15 constraints: wherein the interval global optimization process is configured to, 16

17	apply term consistency to the set of equality constraints
18	over a subbox X, and to
19	exclude portions of the subbox X that can be shown by
20	using term consistency to violate any of the equality constraints,
21	wherein using term consistency involves intersecting the first
22	interval with an inverse of a function derived from the first
23	interval.
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1	23. (Previously presented) The computer-system of claim 22,
2	wherein the interval arithmetic unit includes a first input, wherein the first
3	input includes a first floating point number representing a lower bound of the first
4	input and a second floating point number representing an upper bound of the first
5	input; and
6	wherein the interval arithmetic unit includes a second input, wherein the
7	second input includes a third floating point number representing a lower bound of
8	the second input and a fourth floating point number representing an upper bound
9	of the second input.
1	24. (Previously presented) The computer-system of claim 22, wherein the
2	optimizer is configured to:
3	precondition the set of equality constraints through multiplication by an
4	approximate inverse matrix B to produce a set of preconditioned equality
5	constraints;
6	apply term consistency to the set of preconditioned equality constraints
7	over the subbox X ; and to
8	exclude portions of the subbox X that can be shown to violate any of the
9	preconditioned equality constraints.

1	25. (Previously presented) The computer-system of claim 22, wherein the
2	optimizer is configured to:
3	keep track of a least upper bound f_bar of the function $f(x)$;
4	unconditionally remove from consideration any subbox for which
5	$inf(f(\mathbf{x})) > f_bar;$
6	apply term consistency to the inequality $f(\mathbf{x}) \le f_bar$ over the subbox \mathbf{X} ;
7	and to
8	exclude portions of the subbox X that violate the inequality.
1	26. (Previously presented) The computer-system of claim 22, wherein the
2	optimizer is configured to:
3	apply box consistency to the set of equality constraints $q_i(\mathbf{x}) = 0$ ($i=1,,r$)
4	over the subbox X; and to
5	exclude portions of the subbox X that violate the set of equality
6	constraints.
1	27. (Previously presented) The computer-system of claim 22, wherein the
2	optimizer is configured to:
3	evaluate a first termination condition;
4	wherein the first termination condition is TRUE if a function of the width
5	of the subbox X is less than a pre-specified value, ε_X , and the absolute value of the
6	function, f, over the subbox X is less than a pre-specified value, ε_F ; and to
7	terminate further splitting of the subbox X if the first termination
8	condition is TRUE
1	28. (Previously presented) The computer-system of claim 22, wherein the
2	optimizer is configured to perform an interval Newton step on the John
3	conditions.